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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/744,382	01/23/2001	Hiroyuki Kado	NAK1-bn67	5335

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EXAMINER
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DONG, DALEI

ART UNIT	PAPER NUMBER
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2875

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/744,382

Applicant(s)

KADO ET AL.

Examiner

Dalei Dong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 06 August 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-13 and 15-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13, 15-28 and 30 is/are rejected.
- 7) ☒ Claim(s) 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☒ Certified copies of the priority documents have been received in Application No. 09/744,382.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claim 27 is rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 6,236,159 to Inoue.

Regarding to claim 27, Inoue discloses in Figure 3, an apparatus for sealing a front panel and a back panel that have been placed facing each other with a sealant layer between outer regions of the panels and a gas circulating unit.

Inoue also discloses in Figure 5, “linear barrier ribs are arranged parallel to each other. Since the vent holes 31a and 31b are not located in a diagonally opposite relation but in a juxtaposed relation adjacent to the upper edge of the substrate as described above, a barrier rib located adjacent to the vent hole 31a is provided in a different way from the first embodiment. More specifically, one end of a barrier rib 29 located leftmost as seen in FIG. 5 is extended toward one of opposed interior surfaces of the sealing member 32 adjacent to an upper left vent hole 31a. Similarly to the first embodiment, one end of a barrier rib adjacent to the leftmost barrier rib is extended toward the other interior surface of the sealing member. Each adjacent pair of barrier ribs are arranged in this manner, so that the barrier ribs are arranged in a staggered manner. The number of

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the barrier ribs is properly selected so that one end of a barrier rib 29 located rightmost as seen in FIG. 5 is extended toward the one interior surface of the sealing member adjacent to the upper right vent hole 31b. The extended ends of the barrier ribs 29 may abut against the corresponding interior surfaces of the sealing member 32 like in the first embodiment" (column 9, line 63 to column 10, line 16).

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,846,110 to Kanagu in view of U.S. Patent No. 6,109,994 to Cho.

Regarding to claims 1-11, Kanagu discloses in Figures 5 and 6, a method of manufacturing a plasma display panel comprising " a front panel 10, shown in Figure 6, supported by a glass substrate 11 as a support body is first made in a front panel process P10 (FIG. 5), and a back panel 20 supported by a glass substrate 21 as a support body is manufactured concurrently in a back panel process P20 (FIG. 5)" (column 8, line 4-9).

Kanagu also discloses in Figures 5 and 6, "next, in a sealing process P30 (FIG. 5) the pair of front panel 10 and back panel 10 is arranged to oppose each other (P31), so

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that the panel envelope is formed in a sealing process P32 as described below, at which the peripheral (frame) area of both the panels are sealed with each other” (column 8, line 10-14).

Kanagu further discloses in Figures 5 and 6, the “PDP 1 is completed after sequential passing an exhaust process (P41) at which an internal impurity gas is exhausted with a vacuum pump, and a process P42 at which a discharge gas, a mixture of neon, and a small amount of xenon is filled therein. Pressure of the discharge gas is about 500 Torr” (column 8, line 15-19).

Kanagu further yet discloses in Figures 5 and 6, “on completion of filling the discharge gas, discharge spaces 30 are completely sealed up by tipping off exhaust tube 60; as well as PDP 1 is separated from the external piping system” (column 8, line 20-24).

However, Kanagu does not disclose the shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel when the front panel and the back panel are placed facing each other. Cho teaches “the sealing of outer wall 44 to faceplate structure 42 can be done in a number of ways after the alignment is complete. Normally, the sealing of wall 44 to structure 42 is performed under non-vacuum conditions at a pressure close to room pressure, typically in an environment of dry nitrogen (*dry circulating gas*) or an inert gas such as argon” (column 9, lines 21-26).

Cho also teaches, “regardless of how spacer walls 46 are secured to baseplate structure 40, spacer walls 46 are sufficiently taller than outer wall 44 that a gap 48

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extends between aligned sealing areas 44S and 40S. At this stage of the sealing process, gap 48 normally extends along the entire (rectangular) length of sealing areas 40S and 44S. At the minimum, gap 48 extends along at least 50% of the sealing area length. The average height of gap 48 is normally in the range of 25-100  $\mu\text{m}$ , typically 75  $\mu\text{m}$ . The average gap height can readily be at least as much as 300  $\mu\text{m}$ " (column 10, line 62 to column 11, line 4).

Cho further teaches in Figures 6 and 7, "venting slots can be provided along edge sealing area 44s of outer wall 44 to facilitate removal of contaminant gases during the hermetic sealing operation performed in a vacuum chamber 54 or 74 in any of the processes of Figures 2, 4 and 5. Figure 6 illustrates how a cross section of composite structure 42/44/46 appears when venting slots 90 are provided along wall-edge sealing area 44s. Figure 7 presents a perspective view of structure 42/44/46 with venting slot 90" (column 24, line 5-12).

Cho further yet teaches "in the example of FIGS. 6 and 7, one venting slot 90 is provided in each of the four sub-walls that form outer wall 44. Each venting slot 90 in the illustrated example typically extends for at least 50% of the length of the sub-wall in which that slot 90 is formed. Other arrangements of venting slots 90 can be employed. For example, two or more of slots 90 can be created in one or more of the sub-walls of outer wall 44" (column 24, line 13-20)

Cho finally teaches in Figures 6 and 7, "venting slots 90 can be formed by physically removing portions of outer wall 44 at the slot locations. When the sub-walls of wall 44 are created by firing frit that is in a "green" plastic (soft) state due to the

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presence of binding material in the frit, slots 90 are preferably formed in the sub-walls by appropriately pressing down on the green frit at the locations for vents 90 until they are formed after which the so-slotted frit is fired. Alternatively, when the sub-walls of wall 44 are in a hard (e.g., fired) state, slots 90 can be created by heating the sub-walls to a temperature sufficient to soften them and then appropriately pressing down on the sub-walls at the location for vents 90" (column 24, line 21-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have apply the venting slots of Cho to the sealant layer of plasma display panel of Kanagu in order to facilitate removal of contaminant gases during the hermetic sealing portion and thus increase the luminous intensity and prolong the lifetime of the plasma display panel.

Regarding to claim 12, Kanague discloses in Figure 5, "baking of the sealant material to de-gas therefrom in process P26 greatly decreases the impurities, such as organic solvents, which may emanate in the following sealing process P30 causing pollution of discharge space 30" (column 8, line 49-52). Kanague discloses the claimed invention except for the temperature range of 250°C to the softening point of the sealant layer. It would have been obvious to one having ordinary skill in the art at the time the invention was made to adjust the temperature range between 250°C to the softening point of the sealant layer, since it has been held that where the general condition of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Regarding to claims 13, 15-17, Kanagu discloses a method of manufacturing a plasma display panel comprising forming a phosphor layer on at least one of a main surface of a front panel facing a back panel and a main surface of the back panel facing the front panel and forming a sealant layer on a peripheral region of the main surface of the front panel facing the back panel.

However, Kanagu does not disclose the shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel and the sealing step is performed in a non-vacuum atmosphere. Cho teaches the shape of the sealant layer is set as to provide at least one gap between the peripheral regions of the front panel and the back panel and “using a suitable alignment system (not shown), structures 40 and 42/44/46 are positioned relative to each other in the manner shown in FIG. 2b. This entails aligning sealing areas 40S and 44S (vertically in FIG. 2b) and bringing the interior surface of baseplate structure 40 into contact with the remote (upper in FIG. 2b) edges of spacer walls 46. The alignment is done optically in a non-vacuum environment, normally at room pressure, with alignment marks provided on plate structures 40 and 42. Specifically, baseplate structure 40 is optically aligned to faceplate structure 42, thereby causing baseplate sealing area 40S to be aligned to upper wall edge 44S” (column 10, line 40-51).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have apply the venting sealant layer of Cho for the plasma display panel of Kanagu and further seal the plasma display panel of Kanagu in a non-vacuum



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environment of Cho in order to facilitate removal of contaminant gases and readily and effectively hermetic sealing the panels and thus increase the luminous intensity and prolong the lifetime of the plasma display panel and reduce the manufacturing cost.

5. Claims 18-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,846,110 to Kanagu in view of U.S. Patent No. 6,109,994 to Cho in further view of U.S. Patent No. 5,951,350 to Aoki.

Regarding to claims 18-26, Kanagu discloses a method of manufacturing a plasma display panel comprising forming a phosphor layer on at least one of a main surface of a front panel facing a back panel and a main surface of the back panel facing the front panel and forming a sealant layer on a peripheral region of the main surface of the front panel facing the back panel.

However, Kanagu does not disclose the shape of the sealant layer is set so as to provide at least one gap between the peripheral regions of the front panel and the back panel and the sealing step is performed in a non-vacuum atmosphere and a blue phosphor. Cho teaches the shape of the sealant layer is set as to provide at least one gap between the peripheral regions of the front panel and the back panel and sealing process of the front and back panel takes place in a non-vacuum environment.

However, Cho does not teach a blue phosphor. Aoki teaches "fluorescent substances generally used in PDPs can be used as the fluorescent substance grains contained in the fluorescent substance ink. The following are examples of such fluorescent substances:

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blue fluorescent substance  $\text{BaMgAl.sub.10 O.sub.17 : Eu.sup.2+}$

green fluorescent substance  $\text{BaAl.sub.12 O.sub.19 : Mn or Zn.sub.2 SiO.sub.4 : Mn}$

red fluorescent substance  $\text{(Y.sub.x Gd.sub.1-x)BO.sub.3 : Eu.sup.3+ or YBO.sub.3 :}$

$\text{Eu.sup.3+}$ " (column 7, line 4-14). Aoki teaches the same blue phosphor layer

composition as the specified in the limitation, therefore it would be inherent for the same blue phosphor layer to exhibit the same intrinsic characteristics and properties as detailed in the limitations.

Aoki also teaches in Figure 3, an driving circuit for driving the electrodes of the plasma display panel.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have apply the venting sealant layer of Cho and the blue phosphor layer of Aoki for the plasma display panel of Kanagu and further seal the plasma display panel of Kanagu in a non-vacuum environment of Cho in order to facilitate removal of contaminant gases and readily and effectively hermetic sealing the panels and thus ease the manufacturing process and increase the luminous intensity and prolong the lifetime of the plasma display panel and reduce the manufacturing cost.

Regarding to claim 28 and 30, Kanagu in view of Cho in further view of Aoki disclosed the claimed invention except for the dry gas atmosphere is 130 Pa or lower. However, it is old and well known in the art to have seal the plasma display under low pressure in order to prevent any impurities being sealed into the display device and thus shortens the lifetime of the display, further Applicant has not established the criticality of

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the pressure level to the claimed invention, and Applicant has not done testing or comparative analysis not obvious to one having ordinary skill in the art to demonstrate the advantage of the claimed pressure level, thus the proper pressure level can be determined by routine experimentation by one having ordinary skill in the art.

Furthermore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have adjust the pressure of the sealing environment in accordance to the design specification, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

***Allowable Subject Matter***

6. Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: prior art of record taken alone or in combination fails to teach or suggest a method of manufacturing a plasma display including a step of moving the facing front and back panels with the sealant open gaps through an oven while directing dry gas through nozzles toward side peripheral regions including the spaced gap as the spaced gaps are gradually closed by an application of pressure in order to remove the impurities and improves the light-emitting efficiency and color reproduction of the display panel.

***Response to Arguments***

7. Applicant's arguments filed August 6, 2003 have been fully considered but they are not persuasive.

In response to Applicant's argument that Inoue reference fails to teach or suggest a gas circulating unit for directing heating gas to the sides of the panel; Examiner asserts that in different embodiments of the Inoue reference teaches a gas circulating unit for directing heating gas to the side of the panel, e.g. as shown in Figure 3 of the Inoue reference where the heating gas enters from the bottom left corner and exits the top right corner and along the way the heating gas passes through each side of the panel. Thus Examiner asserts that Inoue reference is valid and maintains the rejection.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Kanagu reference and Cho reference both teaches a method of manufacturing a display panel and thus improve the efficiency and desired characteristics of the display panel; therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to have combine the two references in order to improve the efficiency and desired characteristics of the display panel.

***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.  
August 29, 2003

  
Sandra O'Shea  
Supervisory Patent Examiner  
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